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Presenting Author Zhongli Wang
Co-Authors Tao Li, Kristoffer Almdal, N. Asger Mortensen, Sanshui Xiao, Sokol Ndoni

Organization, Address, City, Country
[1] Department of Micro- and Nanotechnology, Technical University of Denmark, DK-2800 Kgs. Lyngby, Denmark.
[2] Center for Nanostructured Graphene (CNG), Technical University of Denmark, DK-2800 Kgs. Lyngby, Denmark.
[3] Department of Photonics Engineering, Technical University of Denmark, DK-2800 Kgs. Lyngby, Denmark.

Contact@E-mail zhong@nanotech.dtu.dk, sond@nanotech.dtu.dk

Abstract (Century Gothic 11)

Due to strong mode-confinement, long propagation-distance, and unique tunability, graphene plasmons have been widely explored in the mid-infrared and terahertz windows. However, it remains a big challenge to push graphene plasmons to shorter wavelengths in order to integrate graphene plasmon concepts with existing mature technologies in the near-infrared region. We investigate localized graphene plasmons supported by graphene nanodisks and experimentally demonstrated graphene plasmon working at 2 μm with the aid of a fully scalable block copolymer self-assembly method. Our results show a promising way to promote graphene plasmons for both fundamental studies and potential applications in the near-infrared window.

References

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Figures

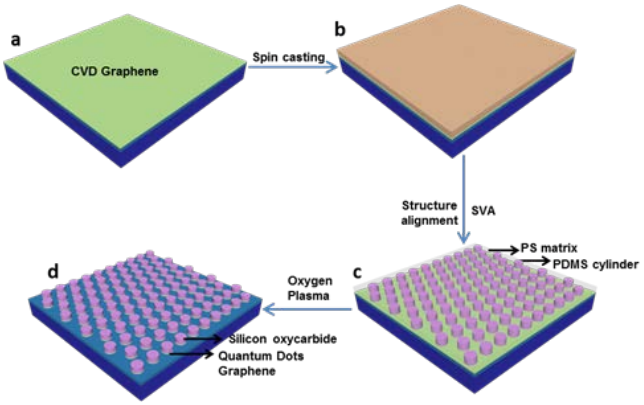

Figure 1: Fabrication of graphene nanodisk arrays (GNDAs) by direct block copolymer nanolithography.

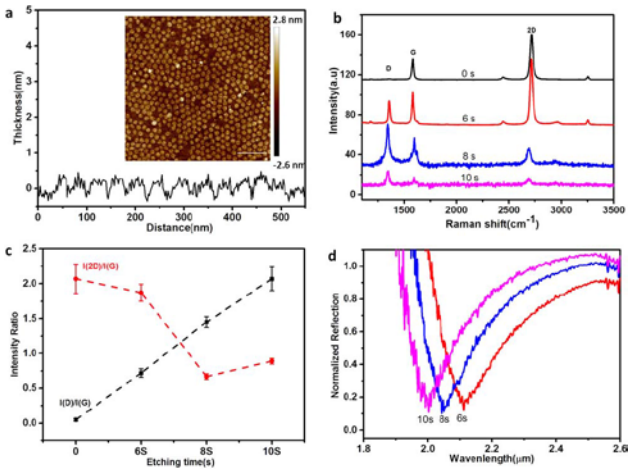

Figure 2: (a) AFM line-scan profile of GNDAs on SiO2/Si substrate after 8 s of oxygen plasma. Inset, corresponding AFM image; scale bars, 200 nm. (b) Raman spectra; (c) evolution of the peak intensity ratios and (d) normalized reflection spectra for the GNDAs/Silicon oxycarbide nanodisk formed after 6, 8, and 10 s of oxygen plasma.